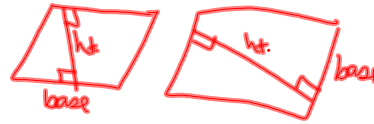


Ch 11 Measuring Length and Area

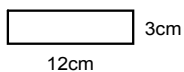
11.1 Area of Triangles and Parallelograms

11.2 Area of Trapezoids, Rhombi and Kites

Area of a rectangle = bh Area of a square = s^2 Area of a parallelogram = bh 

Base and height are perpendicular

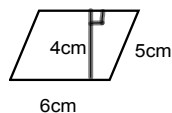
Example 1



$$A = 36 \text{ cm}^2$$

$$P = 30 \text{ cm}$$

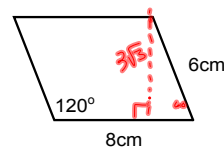
Example 2



$$A = 24 \text{ cm}^2$$

$$P = 22 \text{ cm}$$

Example 3



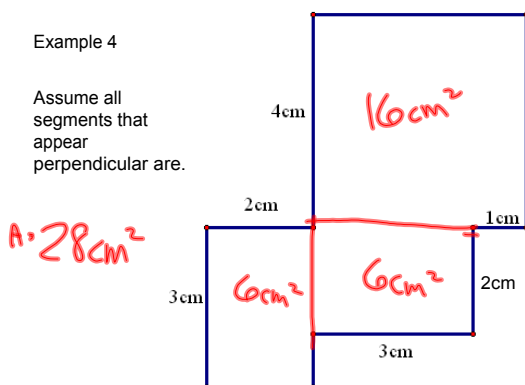
$$A = 24\sqrt{3} \text{ cm}^2$$

$$P = 28 \text{ cm}$$

$$\begin{array}{r|l} 30 & 60 & 90 \\ \hline \times & \times \sqrt{3} & 2 \times \\ & 3\sqrt{3} & 6 \end{array}$$

Example 4

Assume all segments that appear perpendicular are.



Example 5

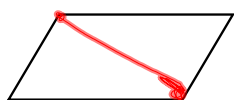
A (-2, 3)
B (4, 1)
C (3, -2)
D (-3, 0)

What shape is it?
Find the area.

$$AD = \sqrt{(-3 - -2)^2 + (0 - 3)^2} = \sqrt{10}$$

$$AB = \sqrt{(4 - -2)^2 + (1 - 3)^2} = \sqrt{40} = 2\sqrt{10}$$

$$AC = 2\sqrt{10} \cdot \sqrt{10} = 20 \text{ u}^2$$



$$A = \frac{1}{2}bh$$

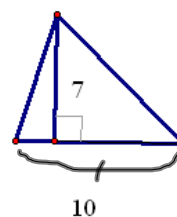
What is the area of this shape?
Cut it in half.

Area of a Triangle = $\frac{1}{2}bh$

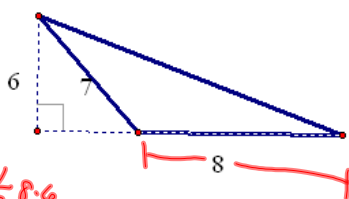
Example 1

$$= \frac{1}{2} 7 \cdot 10$$

$$A = 35u^2$$



Example 2



$$A = \frac{1}{2} 8 \cdot 6$$

$$A = 24u^2$$

Example 3

What is the length of \overline{AB} ?

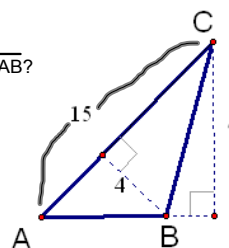
$$\text{Area} = \frac{1}{2} 15 \cdot 4$$

$$\triangle ABC = 30u^2$$

$$A = \frac{1}{2}bh$$

$$30 = \frac{1}{2}AB(7)$$

$$8.6 = AB$$



Example 4

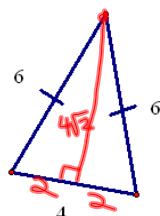
$$36 = h^2 + 4$$

$$\sqrt{32} = h$$

$$4\sqrt{2} = h$$

$$A = \frac{1}{2} 4 \cdot 4\sqrt{2}$$

$$8\sqrt{2}u^2$$



Example 5

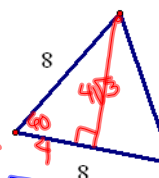
$$A = \frac{1}{2} 8 \cdot 4\sqrt{3}$$

$$16\sqrt{3}u^2$$

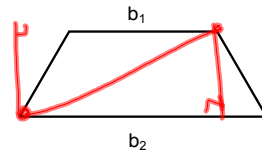
$$\text{Eg } \triangle A = \frac{s^2 \sqrt{3}}{4}$$

$$\frac{64\sqrt{3}}{4}$$

$$= 16\sqrt{3}u^2$$

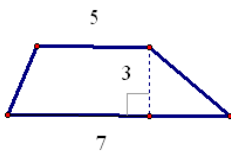


$$\text{Area of an Equilateral Triangle} = \frac{s^2 \sqrt{3}}{4}$$



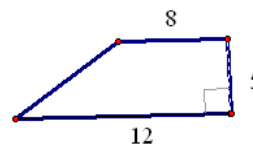
$$A = \frac{1}{2} b_1 h + \frac{1}{2} b_2 h$$

$$A = \frac{1}{2} h (b_1 + b_2)$$



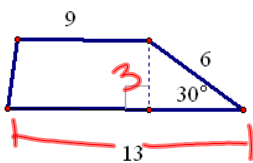
$$A = \frac{1}{2} 3 (5 + 7)$$

$$18u^2$$



$$\frac{1}{2} 5 (12 + 8)$$

$$A = 50u^2$$



$$\frac{1}{2} 3 (9 + 13)$$

$$33u^2$$

R(4, 2)
S(6, -1)
T(-2, -1)
U(-1, 2)



$$A = \frac{1}{2} 3 (5 + 8)$$

$$19.5u^2$$

Area of a Rhombus = $\frac{1}{2} d_1 \cdot d_2$

Area of a Kite = $\frac{1}{2} d_1 \cdot d_2$

M(0, 1) MNPR is a rhombus

N(4, 2)

P(3, -2)

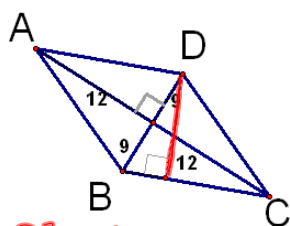
R(-1, -3)



$$MP = \sqrt{18} = 3\sqrt{2}$$

$$NR = \sqrt{50} = 5\sqrt{2}$$

$$A = \frac{1}{2} 3\sqrt{2} \cdot 5\sqrt{2} = 15u^2$$



$$9^2 + 12^2 = AB^2$$

$$15 = AB$$

What is the area of the rhombus?

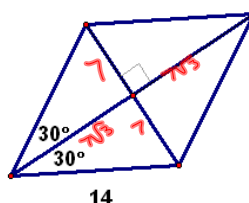
$$\frac{1}{2} 18 \cdot 24 = 216u^2$$

What is the height of the rhombus?

$$A = bh$$

$$216 = 15 \cdot h$$

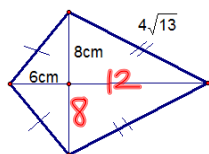
$$14.4u = h$$



What is the area of the rhombus?

$$\frac{1}{2} 14 \cdot 14\sqrt{3}$$

$$A = 98\sqrt{3}u^2$$



$$(4\sqrt{13})^2 = 8^2 + x^2$$

$$208 = 64$$

$$144$$

$$12 = x$$

$$A = \frac{1}{2} 16 \cdot 18$$

$$144cm^2$$

HW

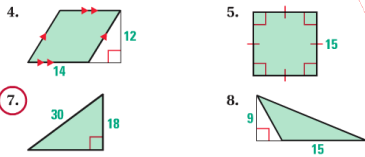
p723-724

#s 4-8, 12, 16-18, 27, 28

p733-734

#s 4, 5, 8, 9, 17, 19, 24, 28, 29

Find the area of the polygon.

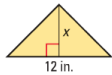


PYTHAGOREAN THEOREM The lengths of the hypotenuse and one leg of a right triangle are given. Find the perimeter and area of the triangle.

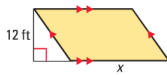
12. Hypotenuse: 15 in.; leg: 12 in.

ALGEBRA Find the value of x .

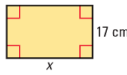
16. $A = 36 \text{ in.}^2$



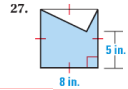
17. $A = 276 \text{ ft}^2$



18. $A = 476 \text{ cm}^2$



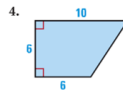
FINDING AREA Find the area of the shaded polygon.



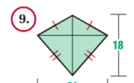
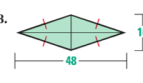
COORDINATE GRAPHING Graph the points and connect them to form a polygon. Find the area of the polygon.

28. $A(3, 3), B(10, 3), C(8, -3), D(1, -3)$

Find the area of the trapezoid.

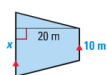


Find the area of the rhombus or kite.

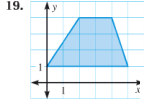


Use area to find x .

17. Area = 300 m^2



Find the area of the figure.



Find area of shaded region.

